

Application No. 10501195
April 12, 2006
YR
CLMPTO
CLAIMS 1-2 (CANCELLED)

Claim 3 (currently amended): A microsphere arranging apparatus, comprising:

a base for mounting a semiconductor device that includes a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected to the interconnection and attached on a surface of the semiconductor wafer, and a resist formed on the semiconductor wafer and having a penetrating hole formed at the respective pad positions to mount the microsphere;

a storage container for storing conductive liquid containing a number of microspheres, said storage container and for supplying microspheres together with the stored conductive liquid to a semiconductor device mounted on the base; and

a retaining device for retaining conductive liquid containing microspheres supplied from the storing container to the semiconductor device.

Claim 4 (currently amended): A microsphere arranging apparatus, comprising:

a base for mounting a semiconductor device that includes a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected to the interconnection and attached on a surface of the semiconductor wafer, and a resist formed on the semiconductor wafer and having a penetrating hole formed at the respective pad positions to mount the microsphere;

a storage container for storing conductive liquid containing a number of microspheres, said storage container and for supplying microspheres together with the stored conductive liquid to a semiconductor device mounted on the base;

a retaining device for retaining conductive liquid containing microspheres supplied from the storage container to the semiconductor device;

a tube that connects between the storage container and the retaining device; and

a pump that is built in the tube to transport conductive liquid containing microspheres retained in the retaining device to the storage container.

Claim 5 (currently amended): The microsphere arranging apparatus according to claim 4, comprising:

a base for mounting a semiconductor device that includes a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and a resist formed on the semiconductor wafer and having a penetrating hole formed at the respective pad positions to mount the microsphere;

a storage container for storing conductive liquid containing a number of microspheres, said storage container supplying microspheres together with the stored conductive liquid to a semiconductor device mounted on the base;

a retaining device for retaining conductive liquid containing microspheres supplied from the storage container to the semiconductor device;

a tube that connects between the storage container and the retaining device; and

a pump that is built in the tube to transport conductive liquid containing microspheres retained in the retaining device to the storage container wherein:

the pump comprises a base, a rotating body and a plurality of rollers that are rotatably attached to the circumference of the rotating body;

the tube is a flexible tube disposed between the roller and the base; and

a clearance between the roller and the tube disposed is provided so as to have a gap that allows microspheres contained in the conductive liquid to pass through inside the tube while having its original shape when the tube is pressed by the rotation of the roller.

Claim 6 (currently amended): A microsphere arranging apparatus, comprising:

a base for mounting a semiconductor device that includes a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and for holding a mask with a penetrating hole formed at the respective pad positions to mount the microsphere so as to allow the hole to be disposed on the pad;

a storage container for storing conductive liquid containing a number of microspheres, ~~said storage container and for~~ supplying the microspheres together with the stored conductive liquid through the mask to a semiconductor device mounted on the base; and

a retaining device for retaining conductive liquid containing microspheres supplied from the storage container to the semiconductor device.

Claim 7 (currently amended): A microsphere arranging apparatus, comprising:

a base for mounting a semiconductor device that includes a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and for holding a mask with a penetrating hole formed at the respective pad positions to mount the microspheres so as to allow the hole to be disposed on the pad;

a storage container for storing conductive liquid containing a number of microspheres, ~~said storage container and for~~ supplying microspheres together with the stored conductive liquid through the mask to the semiconductor device mounted on the base;

a retaining device for retaining conductive liquid containing microspheres supplied from the storage container to the semiconductor device;

a tube that connects between the storage container and the retaining device; and

a pump that is built in the tube to transport conductive liquid containing microspheres being retained in the retaining device to the storage container.

Claim 8 (previously presented): A microsphere arranging apparatus, comprising:

a base for mounting a semiconductor device that includes a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and a resist formed on the semiconductor wafer and having a penetrating hole formed at the respective pad positions to mount the microsphere;

a storage container for storing conductive liquid containing a number of microspheres and for supplying microspheres together with the stored conductive liquid to the semiconductor device mounted on the base;

a retaining device for retaining conductive liquid containing microspheres supplied from the storage container to the semiconductor device;

a tube that connects between the storage container and the retaining device; and

a lift that allows the storage container to move to a position above or below the retaining device.

Claim 9 (previously presented): A microsphere arranging apparatus, comprising:

a base for mounting a semiconductor device that includes a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and for holding a mask with a penetrating hole formed at the respective pad positions to mount the microsphere so as to allow the hole to be disposed on the pad;

CLAIMS 10-19 (CANCELLED)

Claim 20 (previously presented): A microsphere arranging apparatus, comprising:

a mounting-rotating base for mounting a semiconductor device and for rotating the semiconductor device mounted, the semiconductor device including a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and a resist formed on the semiconductor wafer and having a penetrating hole formed at the respective pad positions to mount the microsphere;

a storage container for storing conductive liquid containing a number of microspheres and for supplying the microspheres together with the stored conductive liquid to the semiconductor device mounted on the mounting-rotating base; and

a retaining device for retaining conductive liquid containing microspheres supplied from the storage container to the semiconductor device.

Claim 21 (previously presented): A microsphere arranging apparatus, comprising:

a base for mounting a semiconductor device while disposing the semiconductor device to be inclined, the semiconductor device including a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and a resist formed on the semiconductor wafer and having a penetrating hole formed at the respective pad positions to mount the microsphere;

a storage container for storing conductive liquid containing a number of microspheres;

a first ejection tube for ejecting microspheres together with the conductive liquid;

an oscillator for oscillating the first ejection tube between one end to the other end of the semiconductor device over the semiconductor device inclined; and

a retaining device for retaining the conductive liquid containing microspheres ejected from the first ejection tube to the semiconductor device.

Claim 22 (currently amended): A microsphere arranging apparatus, comprising:

a mounting-rotating base for mounting a semiconductor device and for rotating the semiconductor device mounted, the semiconductor device including a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and for

holding a mask with a penetrating hole formed at the respective pad positions to mount the microsphere so as to allow the hole to be disposed on the pad;

a storage container for storing conductive liquid containing a number of microspheres, ~~said storage container~~ ~~and for~~ supplying the microspheres together with the stored conductive liquid to the pad on the semiconductor device mounted on the mounting-rotating base; and

a retaining device for retaining the conductive liquid containing the microsphere supplied from the storage container to the pad.

Claim 23 (previously presented): A microsphere arranging apparatus, comprising:

a base for mounting a semiconductor device while disposing the semiconductor device to be inclined, the semiconductor device including a semiconductor wafer with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and for holding a mask with a penetrating hole formed at the respective pad positions to mount the microsphere so as to allow the hole to be disposed on the pad;

a storage container for storing conductive liquid containing a number of microspheres;

a first ejection tube for ejecting the microspheres together with the conductive liquid;

an oscillator for oscillating the first ejection tube between one end to the other end of the semiconductor device over the pad of the semiconductor device; and

a retaining device for retaining the conductive liquid containing the microsphere ejected from the first ejection tube to the pad.

Claim 24 (currently amended): A microsphere arranging apparatus, comprising:

a mounting-rotating base for mounting a semiconductor device and for rotating the semiconductor device mounted, the semiconductor device including a semiconductor wafer

with a predetermined semiconductor element and an interconnection and with a number of pads connected the interconnection and attached on a surface of the semiconductor wafer, and for holding a mask with a penetrating hole formed at the respective pad positions to mount the microsphere so as to allow the hole to be disposed on the pad;

a storage container for storing conductive liquid containing a number of microspheres, said storage container ~~and for~~ supplying the microspheres together with the stored conductive liquid to the pad on the semiconductor device mounted on the mounting-rotating base;

a retaining device for retaining the conductive liquid containing microspheres supplied from the storage container to the pad;

a tube that connects between the storage container and the retaining device; and

a lift that allows the storage container to move to a position above or below the retaining device.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☐ **FADED TEXT OR DRAWING**
- ☐ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☒ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.